



Proposal for 2008 Title 24 Global Temperature Adjustment (GTA)

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Proposal for 2008 Title 24



Applicable to:

- **Non-Residential (Commercial Buildings)**
- **New Energy Management Control System (EMCS)**
- **Title: Global Temperature Adjustment (GTA)**

Based on PIER / DRRC Research



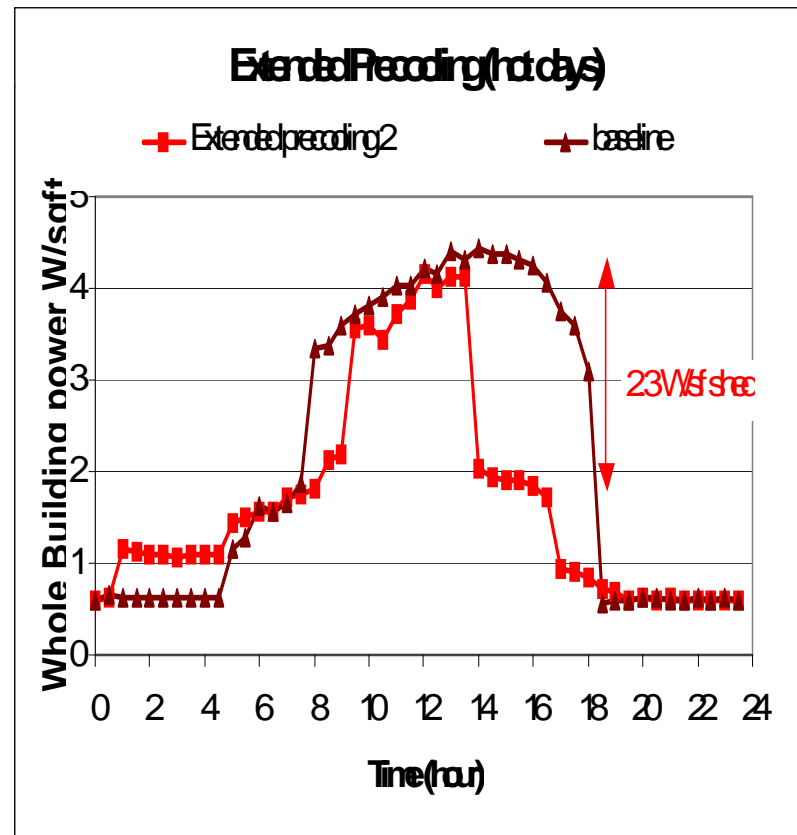
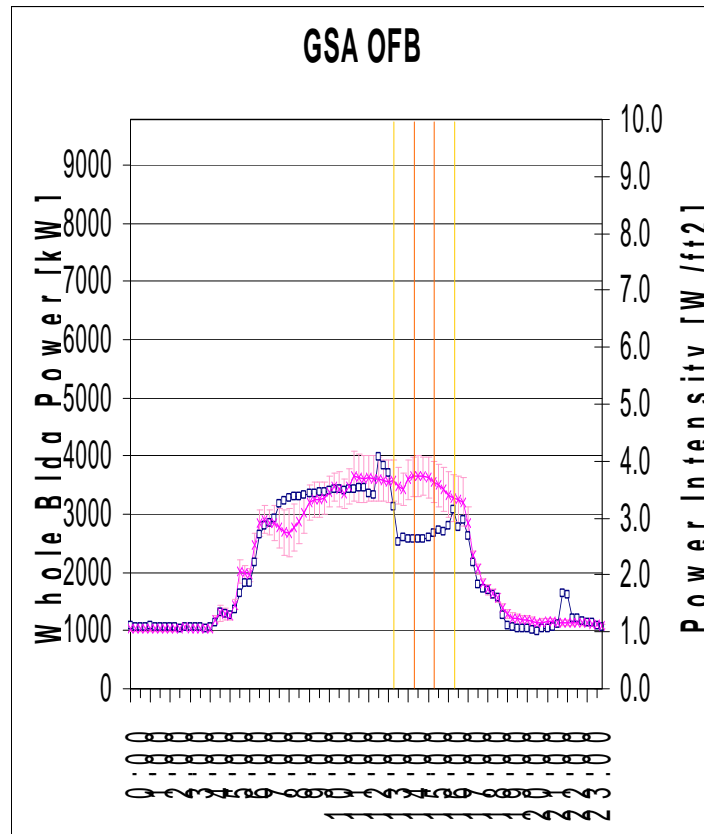
- **Field Studies by Demand Response Research Center in 2003 - 2005**
- **Over 10 Million ft.² commercial floor space tested**

Proposal is Intuitive:



During DR events:

- Turn cooling setpoint up
- HVAC systems “coast” to provide savings



GT A not available in most buildings



- Not in existing buildings
- Not in new buildings
 - This is what we hope to change through Title 24

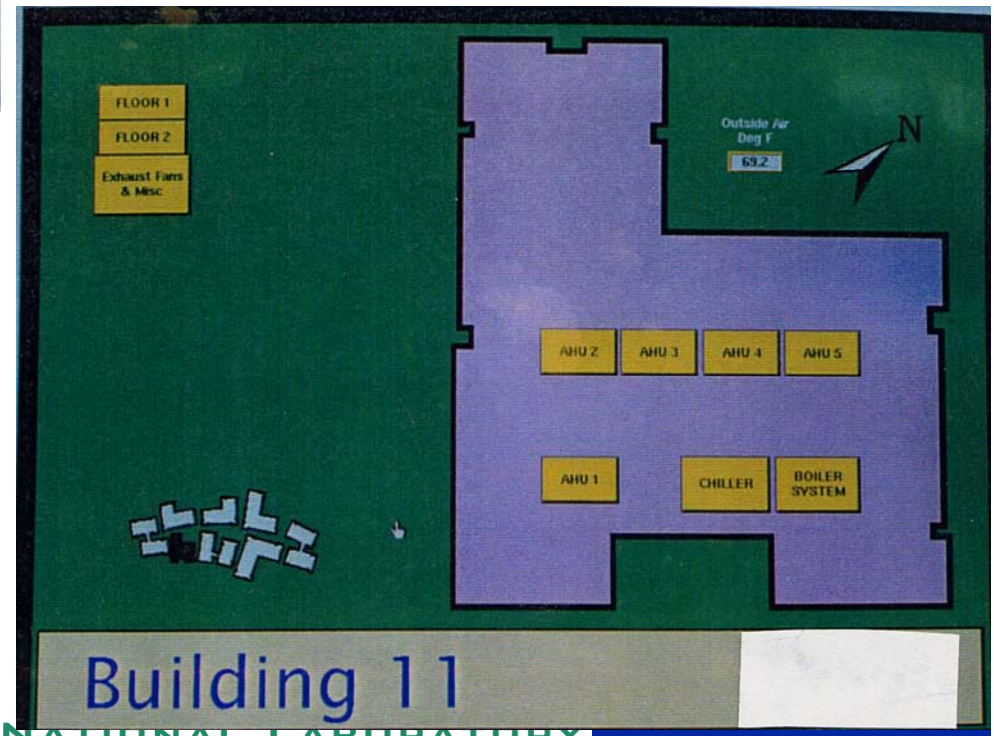
Typical EMCS Temperature Adjustment



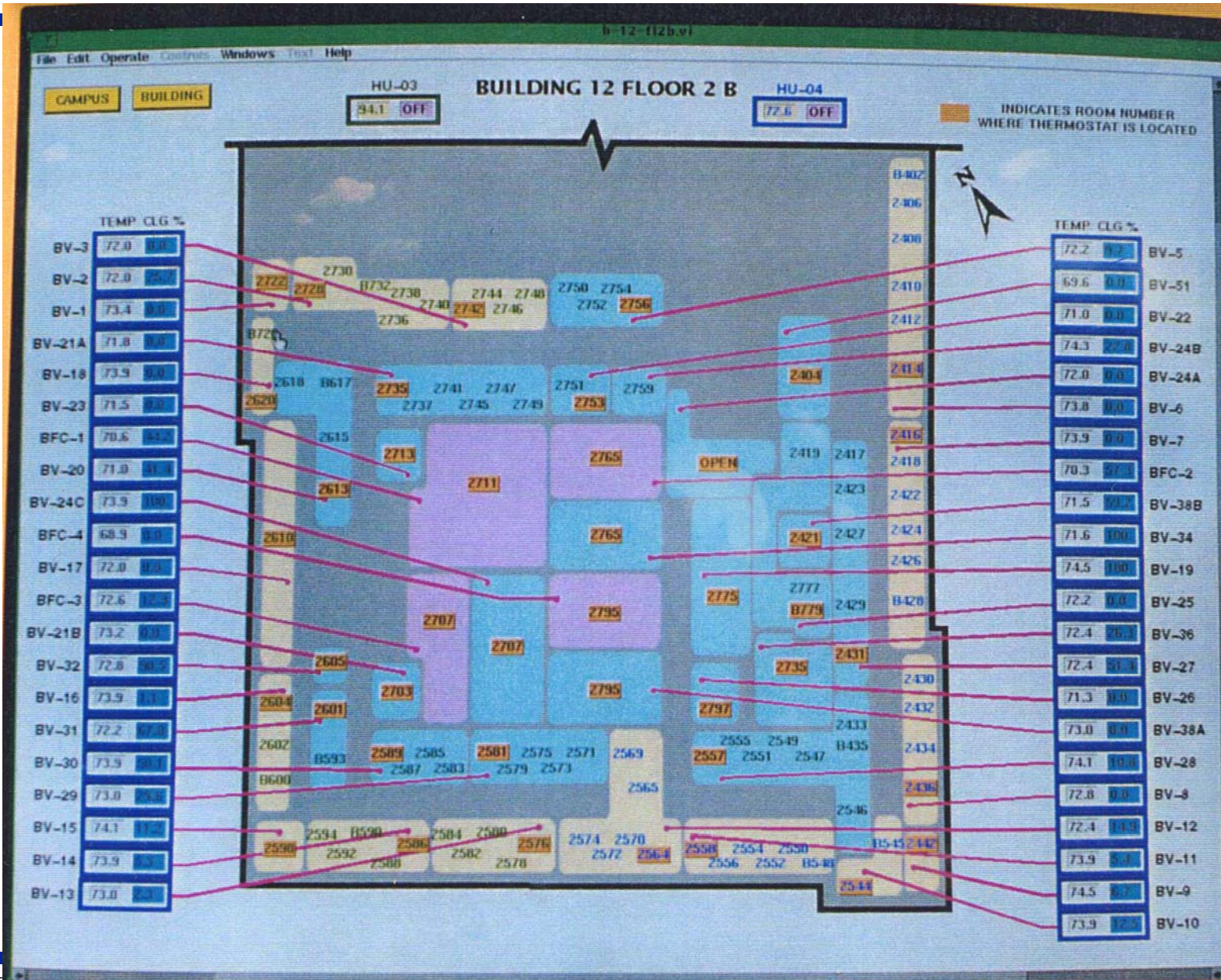
- The setpoint for each “zone” is adjusted individually.
- Up to 1,000s of zones per facility.
- Not practical to adjust whole site manually



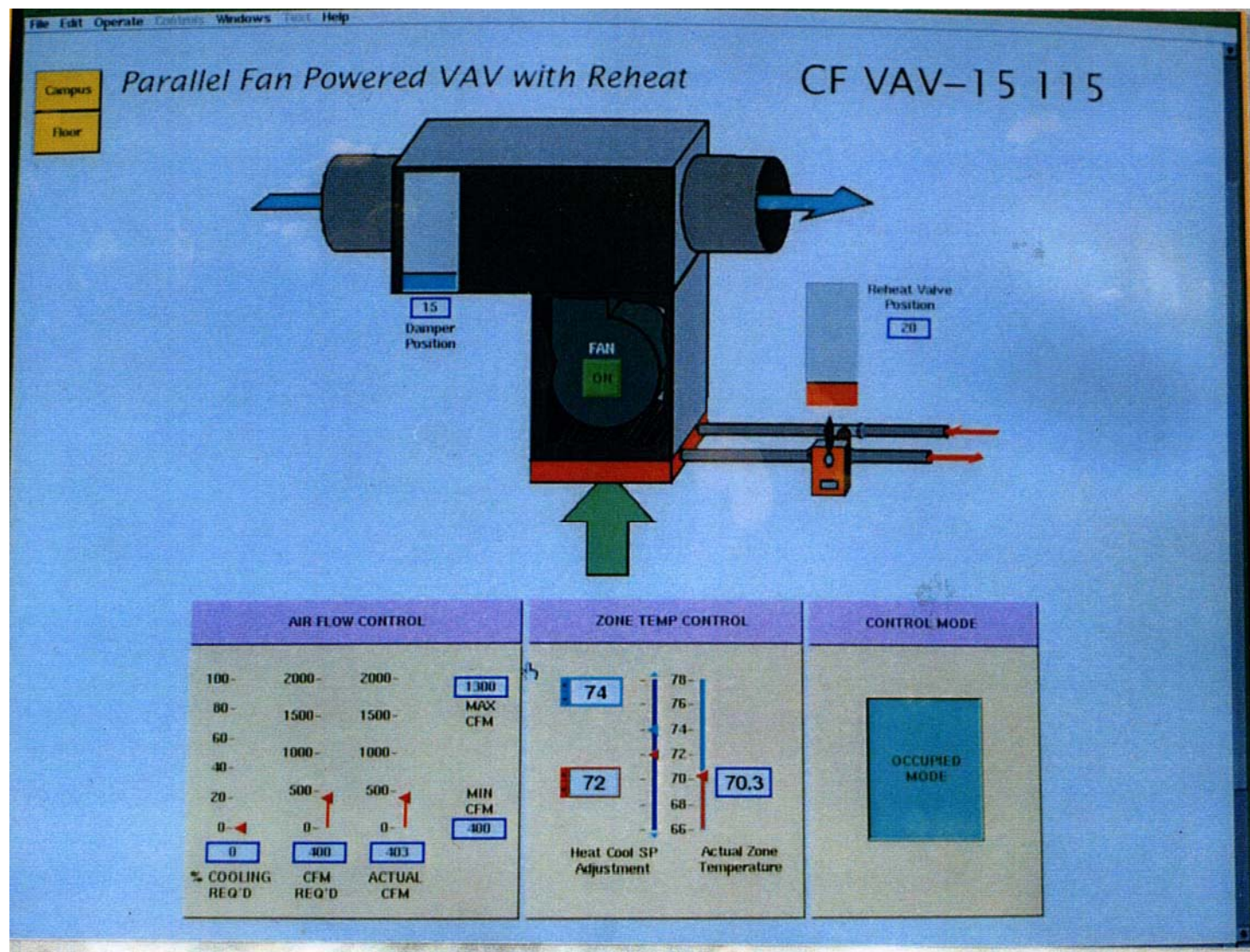
Typical EMCS Graphical User Interface



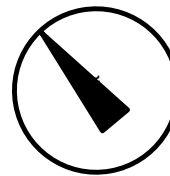
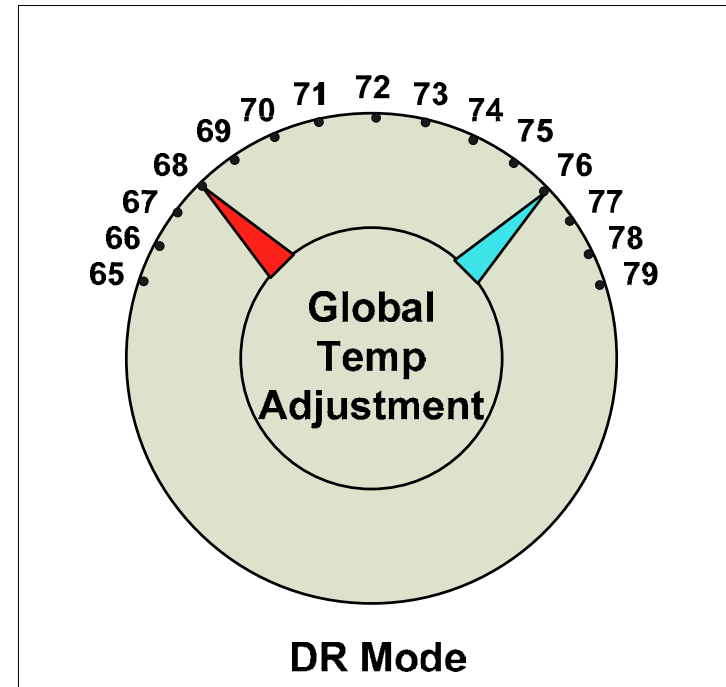
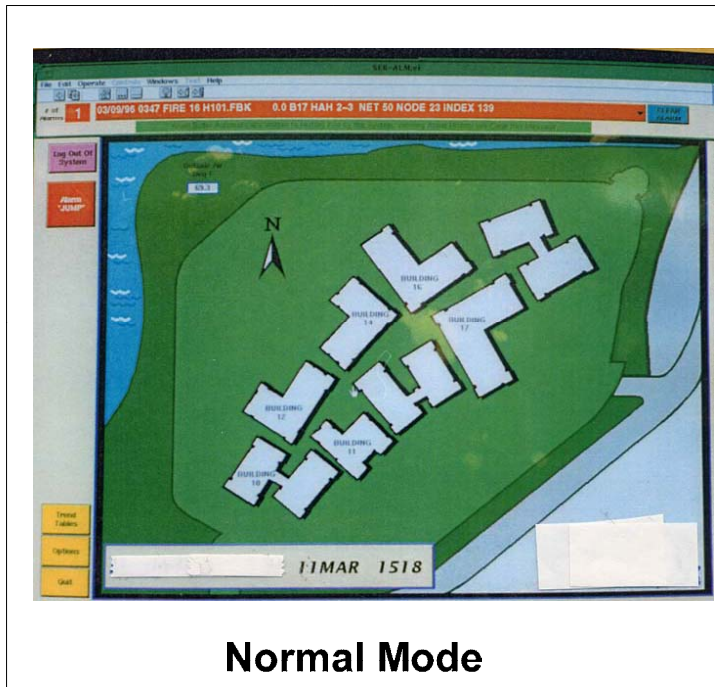
Typical EMCS – Individual zones



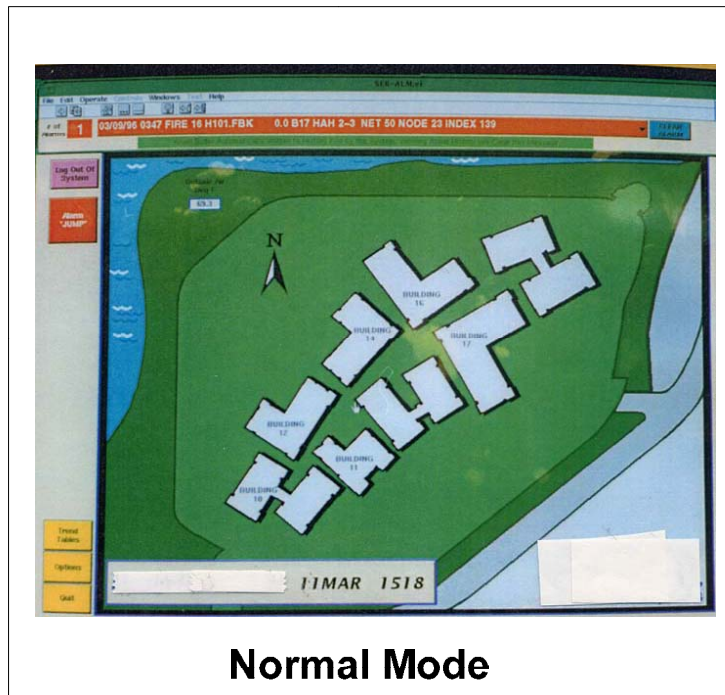
Typical EMCS – Individual zones Adjustment



GTA – Conceptual Implementation #1 (Absolute)



GTA – Conceptual Implementation #2 (Relative)

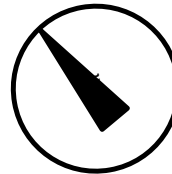


Normal Mode

Global Temp Adjustment
(Relative)

“Relax” each zone
by 2 deg.F

DR Mode



Cost to Implement GTA



- **Software only – no hardware cost.**
- **Several (smaller) vendors already offer this feature at no extra cost.**
 - Sold nationwide
- **Remaining vendors can add GTA to standard product line at a low one-time cost.**
- **Similar global features are common this industry (e.g., night setback).**

Cost / Benefit Summary



- **Costs to implement GTA are negligible**
- **Benefits to commercial building managers and the electric grid are substantial:**
 - **Enables Demand Response (remotely initiated, economic or contingency driven)**
 - **Enables Demand Management (daily on-site peak mngt)**

Proposed Code Language – Section 122 (b):



4. In facilities with multiple space-conditioning zones for comfort heating or cooling, each controlled by an individual thermostatic control, authorized personnel shall have the capability to perform Global Temperature Adjustment (GTA) of the setpoints of all zones simultaneously from a single location. The centrally generated GTA command shall cause the thermostatic control of each individual zone to increase cooling setpoints by at least 2° F and decrease heating setpoints by at least 2° F.

EXCEPTION to Section 122 (b) 4: Systems with stand-alone thermostats that are not connected via an Energy Management and Control System (EMCS) communication network.

Questions & Comments?



Results using GTA (2003-2005)



Site name	Area (ft ²)	Cooling Capacity (Tons)	Strategy Used	# Days of Testing	Climate Zone	Outside temperature at time of peak	Average shed (W/ft ²)*	Peak shed (W/ft ²)
GSA Oakland Federal Building	978,000	3,840	Global Temp Adjustment	4	3	88	0.30	1.10
Contra Costa County 2350 Arnold	131,000	240	Global Temp Adjustment	2	12	90	0.30	0.67
Contra Costa County 50 Douglas	90,000	240	Global Temp Adjustment	2	12	90	0.58	1.34
GSA Santa Rosa Federal Building	80,000	200	Global Temp Adjustment*	20	2	95	1.50	2.40
Sacramento County Building	80,000	180	Global Temp Adjustment*	3	12	70	0.75	1.00
Cisco	4,354,000	24,600	Global Temp Adjustment & other strategies	1	4	90	0.16	0.20
Echelon	75,000	4,800	Global Temp Adjustment & other strategies	2	4	90	0.89	1.22